Contents

Number 1 — January

	1	**Editorials:** **New Address—Present Procedures** **Automatica Prize Paper Awards** **On Book Reviews—A New Editor**
	5	**Announcement: IFAC Education Prize**
		SURVEY PAPER
H. Hanselmann	7	**Implementation of Digital Controllers—A Survey**
		PAPERS
I. R. Petersen	33	**A Procedure for Simultaneously Stabilizing a Collection of Single Input Linear Systems Using Non-linear State Feedback Control**
D. M. Kilgour, K. W. Hipel and L. Fang	41	**The Graph Model for Conflicts**
G. C. Goodwin and D. Q. Mayne	57	**A Parameter Estimation Perspective of Continuous Time Model Reference Adaptive Control**
D. J. Bender and A. J. Laub	71	**The Linear-quadratic Optimal Regulator for Descriptor Systems: Discrete-time Case**
J. C. Willems	87	**From Time Series to Linear System—Part III. Approximate Modelling**
		BRIEF PAPERS
D. G. Luenberger	117	**Dynamic Equilibria for Linear Systems and Quadratic Costs**
A. S. Morse	123	**A $4(n+1)$-dimensional Model Reference Adaptive Stabilizer for any Relative Degree One or Two, Minimum Phase System of Dimension n or Less**
		BOOK REVIEWS
M. Šebek	127	**Two-Dimensional Linear Systems by T. Kaczorek**
T. Vámos	128	**Anticipatory Systems by R. Rosen**
A. Sinha	129	**Real-Time Dynamics of Manipulation Robots by M. Vukobratovic and N. Kircanski**
R. W. Jones	130	**Application of Optimal Control Theory in Biomedicine by G. W. Swan**
	133	*Biographical Notes on Contributors to this Issue*

Number 2 — March

		PAPERS
D. W. Clarke, C. Mohtadi and P. S. Tuffs	137	**Generalized Predictive Control—Part I. The Basic Algorithm**
D. W. Clarke, C. Mohtadi and P. S. Tuffs	149	**Generalized Predictive Control—Part II. Extensions and Interpretations**
K. Shinohara and S. Nonaka	161	**Stability Improvement of a Current Source Inverter-Induction Motor Drive System**
J. V. Candy and J. E. Zicker	175	**Electromagnetic Signal Processing: An Estimation/Identification Application**
G. Casalino, F. Davoli, R. Minciardi and G. Zappa	189	**On Implicit Modelling Theory: Basic Concepts and Application to Adaptive Control**

AUTO 23:6-I

J. B. Moore and G. Casalino — 203 — **On Robustness to Noise of Least Squares Based Adaptive Control**

BRIEF PAPERS

M. Agarwal and D. E. Seborg — 209 — **Self-tuning Controllers for Nonlinear Systems**

V. Wertz and P. Demeuse — 215 — **Application of Clarke–Gawthrop Type Controllers for the Bottom Temperature of a Glass Furnace**

W. R. Cluett, S. L. Shah and D. G. Fisher — 221 — **Robust Design of Adaptive Control Systems Using Conic Sector Theory**

P. Schwarz — 225 — **A Control Strategy for a Six-pulse Bridge Converter Especially Suitable for the Use of Microcomputers**

W. B. Rouse and N. M. Morris — 231 — **Conceptual Design of a Human Error Tolerant Interface for Complex Engineering Systems**

M. Mariton — 237 — **Jump Linear Quadratic Control with Random State Discontinuities**

S. K. Rao and C.-T. Chen — 241 — **Design of Minimal-degree Compensators with Assignable Poles or Structure**

R. Lozano-Leal and R. Ortega — 247 — **Reformulation of the Parameter Identification Problem for Systems with Bounded Disturbances**

TECHNICAL COMMUNIQUES

R. Ortega and R. Lozano-Leal — 253 — **A Note on Direct Adaptive Control of Systems with Bounded Disturbances**

S.-Y. Zhang — 255 — **Input–output Feedback Compensator Design**

E. Mosca and G. Zappa — 259 — **On the Absence of Positive Realness Conditions in Self-tuning Regulators Based on Explicit Criterion Minimization**

BOOK REVIEWS

P. S. Satsangi — 261 — **Introduction to System Science by G. M. Sandquist**

M. G. Rodd — 263 — **Introduction to Robotics: Mechanics and Control by J. J. Craig**

P. M. Taylor — 264 — **Handbook of Industrial Robotics edited by S. Y. Nof**

Y. Y. Haimes and I. Lefkowitz — 265 — **Large-scale Control Systems by M. S. Mahmoud, M. F. Hassan and M. G. Darwish**

267 — *Supplemental List of Reviewers for* **Automatica**, *1985*

269 — *Biographical Notes on Contributors to this Issue*

Number 3 — May

PAPERS

J. C. Wang, P. C. Lu and B. C. McInnis — 275 — **A Microcomputer-based Control System for the Total Artificial Heart**

R. Ylinen, A. J. Niemi and T. Iivarinen — 287 — **A Linear-quadratic-Gaussian Control Algorithm for Sulphide Ore Grinding**

D. R. Downing and W. H. Bryant — 295 — **Flight Test of a Digital Controller Used in a Helicopter Autoland System**

Z. Fathi and W. F. Ramirez — 301 — **Optimization of an Enhanced Oil Recovery Process with Boundary Controls—a Large-scale Non-linear Maximization**

Y. A. Fiagbedzi and A. E. Pearson — 311 — **A Multistage Reduction Technique for Feedback Stabilizing Distributed Time-lag Systems**

Lj. T. Grujić and Dj. Petkovski — 327 — **On Robustness of Lurie Systems with Multiple Non-linearities**

L. Mili, Th. Van Cutsem and M. Ribbens-Pavella — 335 — **Decision Theory for Fault Diagnosis in Electric Power Systems**

B. D. O. Anderson and P. V. Kokotovic — 355 — **Optimal Control Problems over Large Time Intervals**

H. Bourdache-Siguerdidjane and M. Fliess — 365 — **Optimal Feedback Control of Non-linear Systems**

BRIEF PAPERS

M. W. Spong, J. S. Thorp and J. M. Kleinwaks — 373 — **Robust Microprocessor Control of Robot Manipulators**

L. Billmann and R. Isermann — 381 — **Leak Detection Methods for Pipelines**

E. Noldus 387 **Non-linear Model Following**

H. Kano 393 **Existence Condition of Positive-definite Solutions for Algebraic Matrix Riccati Equations**

D. Hertz, E. I. Jury and E. Zeheb 399 **Root Exclusion from Complex Polydomains and Some of its Applications**

TECHNICAL COMMUNIQUE

G. I. Voss, H. J. Chizeck and P. G. Katona 405 **Regarding Self-tuning Controllers for Nonminimum Phase Plants**

J. Ackermann 409 **RESEARCH SURVEY**

BOOK REVIEWS

S. Kahne 413 **Feedback Control of Dynamic Systems by G. F. Franklin, J. D. Powell and A. Emami-Naeini**

C. G. Proudfoot 414 **Principles and Practice of Automatic Process Control by C. A. Smith and A. B. Corripio**

D. J. Hill 415 **Nonlinear Control Systems: An Introduction by A. Isidori**

B. Wittenmark 417 **Control Systems Engineering by S. P. Banks**

419 *Biographical Notes on Contributors to this Issue*

Number 4 — July

SURVEY PAPER

S. T. Glad 425 **Robustness of Nonlinear State Feedback—A Survey**

PAPERS

J. W. Auernig and H. Troger 437 **Time Optimal Control of Overhead Cranes with Hoisting of the Load**

F. Radke and R. Isermann 449 **A Parameter-adaptive PID-controller with Stepwise Parameter Optimization**

K. Tsakalis and P. Ioannou 459 **Adaptive Control of Linear Time-varying Plants**

S. Dasgupta and B. D. O. Anderson 469 **Physically Based Parameterizations for Designing Adaptive Algorithms**

M. Basseville, A. Benveniste, G. Moustakides and A. Rougée 479 **Detection and Diagnosis of Changes in the Eigenstructure of Non-stationary Multivariable Systems**

W. Jakoby and M. Pandit 491 **A Prediction-error-method for Recursive Identification of Nonlinear Systems**

J. P. Norton 497 **Identification and Application of Bounded-parameter Models**

S. Shokoohi and L. M. Silverman 509 **Identification and Model Reduction of Time-varying Discrete-time Systems**

S. Li and T. Başar 523 **Distributed Algorithms for the Computation of Noncooperative Equilibria**

BRIEF PAPERS

M. Vidyasagar 535 **Some Results on Simultaneous Stabilization with Multiple Domains of Stability**

P. Stoica and A. Nehorai 541 **On the Uniqueness of Prediction Error Models for Systems with Noisy Input–Output Data**

BOOK REVIEWS

J. L. Willems 545 **Lineare Kontrolltheorie by H. W. Knobloch and H. Kwakernaak**

S. T. Glad 545 **Nonlinear System Theory by J. L. Casti**

547 *Biographical Notes on Contributors to this Issue*

Number 5 — September

PAPERS

V. J. Lumelsky 551 **Dynamic Path Planning for a Planar Articulated Robot Arm Moving Amidst Unknown Obstacles**

N. Sundararajan	571	**Experimental Evaluation of Flexible Structure Identification using Lattice Filters**
C. E. Puente and R. L. Bras	581	**Error Identification and Decomposition in Large Stochastic Rainfall-runoff Models**
R. Kulhavý	589	**Restricted Exponential Forgetting in Real-time Identification**
Y. C. Soh, R. J. Evans, I. R. Petersen and R. E. Betz	601	**Robust Pole Assignment**
B. D. O. Anderson and M. Deistler	611	**Dynamic Errors-in-variables Systems with Three Variables**
T. T. Georgiou, A. M. Pascoal and P. P. Khargonekar	617	**On the Robust Stabilizability of Uncertain Linear Time-invariant Plants using Nonlinear Time-varying Controllers**
C. C. H. Ma and M. Vidyasagar	625	**Parametric Conditions for Stability of Reduced-order Linear Time-varying Control Systems**
		BRIEF PAPERS
P. Misra and R. V. Patel	635	**Computation of Transfer Function Matrices of Linear Multivariable Systems**
J. B. Moore and D. L. Mingori	641	**Robust Frequency-shaped LQ Control**
V. Feliu and A. J. Avello	647	**Matrix Factorization Method to Stabilize Multivariable Control Systems**
A. Saberi	653	**Simultaneous Stabilization with Almost Disturbance Decoupling-uniform Rank System**
R. F. Curtain and P. Kotelenez	657	**Stochastic Models for Uncertain Flexible Systems**
J. Rasmussen and L. P. Goodstein	663	**Decision Support in Supervisory Control of High-risk Industrial Systems**
		TECHNICAL COMMUNIQUES
D. E. Sebok and R. DeCarlo	673	**On the Controllability of the Parameterized State Matrix in "A Continuation Approach to Eigenvalue Assignment" by Harris, DeCarlo and Richter**
W. E. Schmitendorf	675	**Methods for Obtaining Robust Tracking Control Laws**
		BOOK REVIEWS
W. D. Collins	679	**Singular Perturbation Analysis of Discrete Control Systems by D. S. Naidu and A. K. Rao**
K. P. Valavanis	680	**Non-adaptive and Adaptive Control of Manipulation Robots by M. Vukobratovic, D. Stokic and N. Kircanski**
A. Benveniste	681	**Commande Adaptative Aspects Pratiques et Théoriques edited by I. D. Landau and L. Dugard**
P. A. Cook	682	**Nonlinear Oscillations in Feedback Systems by V. Biró**
	685	*Biographical Notes on Contributors to this Issue*

Number 6 — November

		SURVEY PAPER
A. Johnson	691	**The Control of Fed-batch Fermentation Processes—A Survey**
		PAPERS
S. Vajda, P. Valkó and K. R. Godfrey	707	**Direct and Indirect Least Squares Methods in Continuous-time Parameter Estimation**
S. Pohjolainen	719	**On the Optimal Tuning of a Robust Controller for Parabolic Distributed Parameter Systems**
R. Hanus, M. Kinnaert and J.-L. Henrotte	729	**Conditioning Technique, a General Anti-windup and Bumpless Transfer Method**
		BRIEF PAPERS
K. Kadiman and D. Williamson	741	**Discrete Minimax Linear Quadratic Regulation of Continuous-time Systems**
S. Sen and S. J. Yakowitz	749	**A Quasi-Newton Differential Dynamic Programming Algorithm for Discrete-time Optimal Control**

Yu. V. Orlov and V. I. Utkin	753	**Sliding Mode Control in Indefinite-dimensional Systems**
Y. A. Fiagbedzi and A. E. Pearson	759	**A PI-Controller for Distributed Delay Systems**
T. Fujinaka and M. Araki	763	**Discrete-time Optimal Control of Systems with Unilateral Time-delays**
B. Wittenmark, R. J. Evans and Y. C. Soh	767	**Constrained Pole-placement using Transformation and LQ-design**
R. Doraiswami	771	**Measures of Overshoot, Speed of Response and Robustness**
P. K. Kitanidis	775	**Unbiased Minimum-variance Linear State Estimation**
J.-J. Fuchs	779	**On Estimating the Order of an ARMA Process**
M. Mariton	783	**Stochastic Controllability of Linear Systems with Markovian Jumps**
K. Yamanaka and E. Shimemura	787	**Effects of Mismatched Smith Controller on Stability in Systems with Time-delay**
		TECHNICAL COMMUNIQUES
R. H. Middleton	793	**Indirect Continuous Time Adaptive Control**
R. Scattolini and N. Schiavoni	797	**Generalized Minimum Variance Control of MIMO Systems—A Stability Result**
		CORRESPONDENCE ITEM
M. Kümmel and D. Seborg	801	**A Contemplative Stance for Chemical Process Control**
		BOOK REVIEWS
K. S. Hindi	803	**Control Systems Design: An Introduction To State-space Methods by B. Friedland**
L. Wozniak	804	**Modern Control Systems: A Manual of Design Methods by J. A. Borrie**
J. van Amerongen	805	**Control Systems Modeling and Analysis by G. Voland**
D. Kraft	807	**Optimal Estimation with an Introduction to Stochastic Control Theory by F. L. Lewis**
	809	*List of Reviewers for* **Automatica**, *1986*
	813	*Biographical Notes on Contributors to this Issue*
	i	*Index to Volume* 23 (1987)